

SKYCITY – lighting up Auckland for less

For more than a decade, the lights of the Sky Tower at SKYCITY Auckland have been a defining feature of the Auckland landscape. Now, by making energy management a priority, the Sky Tower shines as brightly - for less than half the cost.

Entertainment – a power intensive business

One of the largest entertainment complexes in the Southern Hemisphere, SKYCITY Auckland includes a casino, 700 seat theatre, several large convention halls, 19 bars and restaurants, and two large hotels as well as the iconic Sky Tower. It is not surprising that the energy bill is significant - with lighting and power consuming more than 40 million kWh of electricity a year.

A dedicated role

Eco-tourism has always been important to SKYCITY and its customers. It has had an environmental policy in place since 2005, although its implementation has taken a few years to make an impact.

In mid 2007, SKYCITY Auckland's facility management team engaged Jonathan Woodbridge-Buys (an energy and environmental engineer) to look at ways to reduce energy use. Jonathan developed a comprehensive strategy focusing on the tower, car parks and hotel's multi-million dollar energy and utilities budget. He concentrated on the areas of biggest spend, looking at where the smartest and fastest returns could be made.

Lighting the way for savings

Jonathan saw huge potential for immediate improvement, particularly with SKYCITY's inefficient lighting. Around 1,600 high intensity halogen lamps were used in the corridors in the SKYCITY's two hotels. Jonathan observed that the corridors were very warm, due to old 12V halogen technology – which generates more heat than light.

SKYCITY Auckland's main carpark is one of New Zealand's largest, with more than 2,000 parks. Open 24 hours and lit day and night, it contributed significantly to energy consumption.

Another area ripe for improvement was the floodlighting on the iconic Sky Tower, which had been in place since the complex opened in 1997. The metal halide technology was energy intensive and difficult to maintain, due to the 328m height and environmental corrosion. Changing the light filter colours to mark occasions such as St Patrick's Day and Breast Cancer Awareness Week was also a challenging job, with room for improvement.

Testing, testing

Before deciding how to tackle these issues, Jonathan did his homework – talking to suppliers, others in the industry and the Energy Efficiency and Conservation Authority (EECA) about different types of lighting technology and how practical different types of technology would be for this situation.

In the corridors Jonathan experimented with eight different types of energy efficient lights – five different LED lights and three different types of compact fluorescent lights (CFLs).

To address the inefficient carpark lighting he considered a number of options, before engaging a lighting designer to come up with a luminaire that reflected light sideways. This innovative design enabled a greater area to be illuminated more evenly and more efficiently. The new luminaires are now installed in all SKYCITY Auckland's carpark areas.



The SKYCITY Tower.

✓ Key features

- \$1.3 million investment in SKYCITY Auckland's Energy Efficient Lighting Project
- Expected payback in just over three years
- All hotel corridor and lift lobby lights upgraded from halogen to CFL
- Lighting in main car park lifts, lift lobbies and carpark area upgraded to efficient T8 luminaires
- Metal halide floodlighting on upper Sky Tower replaced with remote controlled LED system

✓ Key benefits

- 4.5 million kWh saved in just two years
- Upgrading from halogen to CFL in corridors, lifts and lobby areas saves around 80% in energy
- 4,750 light tubes in main car park reduced to 3,000 with improved light quality and 50% energy saving
- Use of latest LED technology for Sky Tower reduced energy consumption by 66% with greater convenience and reduced maintenance

✓ Sector relevance

- Hotels
- Event centres
- Sports complexes
- Shopping complexes

The Sky Tower lighting solution took a little longer – it was important to select the right technology given the unique challenges in lighting the tallest building in the Southern Hemisphere. Jonathan eventually decided on the latest energy efficient LED technology on a remote control system – and installation was completed in June 2009.

Retaining ambience

SKYCITY General Manager New Zealand Facilities Development, Simon Jamieson, was concerned that replacing halogen lighting with fluorescents would be too bright and white, and would affect the ambience of the corridors and other spaces. After some intensive experimentation, a similar effect to the halogens was achieved using the smallest (10W) CFLs available.

Results

SKYCITY Auckland has achieved an 80% energy saving by replacing 12V halogen lamps with CFLs in corridor, lobby and lift areas.

The main carpark lighting improvements focused on reusing sustainable lighting components and halved the number of lamps required. This halved overall energy consumption, while producing better quality and more even light.

The Sky Tower's new LED lighting system uses 66% less energy than the old floodlights. LEDs are long-lasting, can produce millions of different colours and be controlled from a laptop – making the job of changing the colour of the Sky Tower much easier. The lower tower was also upgraded to very narrow beam HID luminaires, which spill less light into the night sky. This means only around half the energy is needed to achieve the lighting effect for the lower tower.

An ongoing process

Lessons learned from these projects have since been applied to other areas of the complex with similar results, including SKYCITY Auckland's Federal and Nelson Street car parks.

SKYCITY Auckland also has a range of projects underway aimed at improving ventilation, cooling and heating efficiency. A wind turbine on top of the Sky Tower contributes to research into distributed urban micro-generation. A very efficient solar water heating system was installed early in 2010 to preheat all the water entering the water heating system during daylight hours.

New gaming machines emit less light and heat, further reducing the energy needed to continuously cool the Casino gaming floors.

In recognition of its efforts to date, SKYCITY Auckland's Grand Hotel and the SKYCITY Hotel were both awarded Qualmark's Enviro-Gold rating in early 2010, the highest environment award available in New Zealand.

Key personnel

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SKYCITY Auckland perspectives

"Our Enviro-Gold rating will give us the opportunity to really differentiate ourselves from our competitors.

We always knew that energy efficiency is good business – but I wasn't really expecting to see the bottom line benefits in the business quite so quickly."

Simon Jamieson,
SKYCITY General Manager
New Zealand Facilities
Development

"Energy conservation at SKYCITY works to an 'it has to do good not just feel good' mantra. We aren't going to partake in energy saving initiatives unless they pay themselves off and produce a return on investment."

Jonathan Woodridge Buys,
SKYCITY Auckland Energy and
Environment Coordinator

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